DOCUMENT RESUME

ED 176 528 EC 120 882

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TITLE A Review of the Literature on the Early Identification of Delinquent-Prone Children.
INSTITUTION California State Dept. of the Youth Authority, Sacramento.
PUB DATE Jan 78
NOTE 60p.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Delinquency; Exceptional Child Research; *Identification; Intervention; Labeling (of Persons); *Prediction; *Predictive Measurement; Predictor Variables; *Prevention; Research Methodology; Teacher Role

ABSTRACT

The paper reviews research on the early identification of delinquent-prone children and considers the role of prediction in developing effective delinquency prevention programs. Among issues addressed are definitions of delinquency, theories on causation, and the role of prediction in criminology. Pros and cons of prediction are examined. Among negative issues considered are invasion of privacy and justice, cost, and labeling. Prediction methodology is analyzed, and implementation factors (what to predict, how to predict, when to predict, and what to do as a result of prediction information) are discussed. The role of the teacher in predicting delinquency is addressed. Recommendations are made concerning the development of intervention programs in the public schools. (CL)

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A Review of the Literature on the Early Identification of Delinquent-Prone Children

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Highlights

- The need for delinquency prevention programs remains a high priority issue. In California in 1976, there were 353,752 juvenile arrests, nearly 30% of these at the felony level.
- The official record of juvenile arrests is only part of the picture. Studies on self-reported delinquency indicate that there may be as many as nine unreported delinquent acts for every delinquent arrest (9 times 353,752 equals over three million juvenile crimes).
- According to Wolfgang, it may be expected that 35% of the youth population will be arrested at least once by age 18.
- It is argued that delinquency prevention programs can be made more effective by utilizing prediction methods to identify predelinquents.
- The study of prediction methodology began as early as 1923, but little has been done in the field in recent years.
- It has been asserted that prediction instruments can be useful in indicating treatment needs.
- Opponents to prediction claim that existing methods overpredict delinquency, place harmful labels on children, and represent an invasion of privacy.
- Proponents claim that the overprediction problem can be solved and that there is little evidence to support the argument that prediction results in harmful effects due to labeling. The counter-argument is made that the offering of services to children manifesting problems does not represent an invasion of privacy.
- Timely, effective prediction and intervention can save money when it prevents a youth from behaving so negatively that he is placed on probation or committed to an institution.
- Advanced statistical techniques are available to improve the effectiveness of prediction, such as multiple regression analysis.
- Although predictions can be made when children are quite young, based on such variables as early school misbehavior, the consensus in the literature supports prediction during young adolescence, between the ages of 10 and 13.
- Written tests have not been found to be reliable for prediction. Judgments of teachers, based on youths' school behavior, have proven to be more reliable.

Recommendations

- Initially, and primarily, it is recommended that support be given to efforts to develop effective prediction methodology both in local communities and in the CYA. Such projects would include the development and validation of prediction scales. Longitudinal followups over a period of years would be required to properly validate the method.
- Standardized measures of delinquent behavior should be developed. Depending upon the nature of the particular programs, consideration should be given whether to use as a delinquency prediction criterion (1) any arrest for illegal behavior, (2) chronic arrest patterns, (3) self-reported delinquent behavior, or (4) any of several other measures of delinquency (conviction, incarceration, referral, etc.).
- Research should be conducted to determine the effect of labeling a child as a predelinquent. Does prediction actually cause a label to be placed on the child? Is the child aware of the label? Are significant others aware of the label? What are the effects of the label? Are any possible negative effects counterbalanced by the positive effects of intervention services?
- Prediction studies should be implemented using combinations of teacher judgments, personality data, and school records of misconduct, underachievement, and truancy.
- Investigate the possibility of predicting certain major kinds of delinquency: violent behavior, destructive behavior, avoidance behavior (drugs, truancy, runaway).
- Develop efficient, accurate, and objective methods to assist teachers in predicting later problem behavior.
- The Prevention and Community Corrections Branch of the CYA, that arm of the CYA that deals directly with local agencies in handling youth, should investigate the possibility of establishing a similar relationship with the schools, for it is within the school system that we have the greatest opportunity to detect predelinquents and prevent the development of delinquent careers.

Review of the Literature on the Early Identification of Delinquent-Prone Children

This paper is based on a review of the literature pertaining to the early identification of delinquent-prone children. In this paper, the term "early identification" is considered synonymous with the concept of "prediction." A basic premise herein is that delinquency prevention can be more effectively achieved through the implementation of programs designed to predict delinquency among children at an early age. At present, delinquency prediction has not fulfilled its potential in the prevention process. The potential exists, but has not yet been realized due to the inadequacy of prediction research and development.

In the following sections, we attempt to answer the question of how prediction methods can aid in the development of effective delinquency prevention programs. We will explore various theories on the causes of delinquency, review the history of prediction research efforts, discuss both the positive and negative aspects of delinquency prediction, and present conclusions regarding future needs in the field of prediction.

Need for Prevention

The need for delinquency prevention programs has never been greater than it is today. According to California State Department of Justice statistics, in 1976 the juvenile arrest rate was 1,644 per 100,000 population, resulting in 353,752 juvenile arrests, nearly 30% at the felony level. National estimates for 1977 are available from a congressional report prepared by the U.S. Senate Committee on the Judiciary (1977). "Approximately 1 million juveniles will enter the juvenile justice system this year. Although 50% will be informally handled by the juvenile courts' intake staff, 40% will be formally adjudicated and placed on probation or other supervisory release. Ten percent, or approximately 100,000 young people, will be incarcerated in juvenile institutions." The committee estimates that the cost of maintaining the juvenile justice system is over $1 billion a year.

Such figures only represent official delinquency, those delinquent acts for which arrests have been made. As with the proverbial ice berg, there is a hidden mass of delinquency which is undetected and unreported. An extreme

example may be found in a study of teenagers in Flint, Michigan (Haney and Gold 1973). The researchers discovered that, in a sample of 522 youths, 433 admitted to 2,490 delinquent acts;* yet only 47 youths and their 80 offenses were recorded in police records. This means that only 11% of the youths who had committed delinquent acts had been arrested. In another study (Gould, 1969), self-reported delinquency showed a low correlation of .16 with police contacts.

These figures clearly indicate that a large proportion of youths are involved in delinquent behavior. Needless to say, prevention programs cannot and should not attempt to include every youth who may, at some time during his adolescence, commit a delinquent act. The cost of such a comprehensive program would be prohibitive, and many youths who commit their first delinquent act never commit a second.

In Wolfgang's well-known study of delinquency in a Philadelphia birth cohort (1973), 35% of the 9,945 youths in his sample had been arrested at least once by age 18. However, among those youths arrested for their first delinquent act, nearly half never again came to the attention of the authorities. Of those charged with a second delinquent act, over one-third desisted from further delinquency. According to Wheeler and Cottrell (1970), "Given the relatively minor, episodic, and perhaps situational induced character of much delinquency, many who have engaged in minor forms of delinquency once or twice may grow out of this pattern of behavior as they move toward adulthood. For these, a concerted policy of doing nothing may be more helpful than active intervention." On the other hand, Wolfgang also found that 627 boys, or 6% of the cohort, had each committed five or more offenses and were responsible for 52% of all reported delinquent acts. The data clearly indicate that although many youths may commit a delinquent act once or perhaps twice during adolescence, the bulk of the offenses are committed by a relatively small group of repeat offenders.

In the broadest terms, the goal of prevention programs is to prevent delinquency. Achieving this goal can assume two approaches, each requiring

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*The researchers' definition of delinquent acts included 601-type offenses. Some of the most frequent offenses admitted to were theft, drinking, breaking and entering, truancy, and gang fights. Haney and Gold's definition of a delinquent act is quite broad and represents one kind of problem encountered in dealing with the concept of delinquency.

somewhat different kinds of intervention techniques. If preventing delinquency is considered to mean reducing the incidence of juvenile crime, more success might be expected to result from dealing with the relatively small population of serious repeat offenders, and intervention methods would necessarily have to be designed for treating these more difficult cases. If the goal is to reduce the total numbers of youths who commit delinquent acts, then the intervention program would assume a different nature and be designed to serve a much wider population of youths in order to come in contact with the largest possible number of potential delinquents.

Definition of Delinquency

Before developing causal theories or prediction methods, it is necessary to define the phenomenon we are trying to isolate and predict. One of the earliest definitions of delinquency was proposed in 1925, when the National Probation Association defined a delinquent child as one who violates any law or ordinance; is wayward or habitually disobedient and uncontrollable by his parents, guardians, or custodians; is habitually truant from school or home; and habitually comports himself as to impair or endanger the morals or health of himself or others. This general definition is so flexible that almost any misbehaving child could be classified as delinquent. The California Youth Authority, as recently as June 1977, has selected as a definition of delinquency that contained in Webster's New World Dictionary: "Behavior by minors, of not more than a specified age, usually 18, that is antisocial or in violation of the law." This definition, too, makes difficult the determination and measurement of delinquent behavior. The weakness here is the term "antisocial." An antisocial act can be considered anything from spitting on the sidewalk to assassinating a president. Even attempts to use behavioral terms to define delinquency often result in a lack of precision and consistency. The commonly used term "incorrigible" incorporates a wide variety of troublesome behaviors, and means different things to different people. Another problem deals with the frequency of behavior: how often must a child be truant before he is "habitually" truant? Does one act of petty theft qualify a youth as a delinquent? In their studies the Gluecks defined the "true delinquent" as one who may be expected to commit repeated acts of delinquency, while "pseudodelinquents" are those who very occasionally deviate from socially acceptable norms of conduct, but whose school misbehavior may indicate other maladjustments damaging to personality and classroom functioning.

Just what, then, shall be considered to be delinquency? Gould (1969) clearly states the dilemma: "Should the concept 'delinquency' ...refer to all behavior which is in violation of the law... or should the concept be applied only to behavior which someone has perceived as being a violation and has responded to as if it were a violation?" Some investigators (Kvaraceus & Ulrich, 1959; Becker, 1963; Erickson, 1966) have preferred to define as delinquency only those acts which society, represented by appropriate agents of social control, have responded to as violations of the law. "Since criminologists have not used this kind of definition of crime, preferring instead to define crime in terms of all acts which are in violation of the law, their problems of measurement have been severe because official statistics vastly underestimate the total incidence of delinquent acts" (Gould, 1969).

The use of officially-recorded delinquency as the dependent variable in prediction research has contributed greatly to the unsatisfactory and sometimes contradictory findings. Confusion results when in one study a variable is found to be highly predictive of delinquency, while in another study the same variable is not found to be predictive. Accurately determining which variables predict delinquency becomes complicated when comparing officially-recorded delinquents with nondelinquents because of the possibility of a high incidence of unrecorded delinquency among any random sample of so-called nondelinquents. If there are any common causes of delinquent behavior, then these factors will likely be present both among officially-recorded delinquents and those "nondelinquents" whose antisocial behavior has gone undetected. Haney and Gold's (1973) data, shown in Table 1, are representative of the problem faced in prediction research when using the dichotomy of official delinquent vs. nondelinquent.

Table 1

Haney and Gold Data Showing Relationship Between Self-Reported Delinquency and Official Delinquency

		Delinquents by Age 17		Nondelinquents by Age 17	
	Total	n	%	n	%
Study Subjects 13-16 years old	522	47	100.0	475	100.0
Self Reports:					
Admitted to delinquent acts	433	47	100.0	388	81.0
Did not admit to delinquent acts	89	0	0	89	19.0

Using this sample, it would have been difficult, if not impossible, to identify the 47 subjects who became officially-recorded delinquents by age 17, when 81% of the "nondelinquent" sample, according to their own self-reports, had also committed delinquent acts.

Wirt and Briggs (1965) support the use of self-reported delinquency data in the attempt to clarify the true extent of illegal behavior among adolescents. These authors quote Dentler: "There is evidence in the available literature that given [appropriate] conditions [of data collection], self-report data are sufficiently reliable and valid to make their collection and analysis eminently worthwhile."

Short and Nye (1970) also believe that the use of official delinquency statistics has hampered research on etiology and prediction. They note that official statistics vary from jurisdiction to jurisdiction due to differential reaction by authorities to a misbehaving youth's personality, family, and neighborhood relations, and according to the philosophy, facilities and skills of the personnel handling each case.

Theories on the Causes of Delinquency

Establishing a delinquency prevention program presupposes knowledge in two areas: first, what treatment or services to provide, and second, to whom these services should be directed. That is to say, there must be awareness of the delinquency-causing factors to be treated, modified, alleviated, or removed and, to increase both the economy and effectiveness of the program, it must be possible to identify for treatment those youths who, without intervention, can be expected with a high degree of certainty to respond in a delinquent manner to the causal factors.

There are those who believe that any prediction method must be firmly based on a particular theory of delinquency causation. For instance, Weinberg (1954) states "theory and prediction have an integral relationship in a scientific endeavor. The function of theory is to explain the processes which contribute to or cause criminal behavior. The function of prediction is to test theory by relating the processes to outcome for a series of cases." Presented below is a brief discussion of the various theories that have been developed in the effort to explain the causes of delinquency.

Religious views. Among the oldest beliefs in the western world regarding the causes of delinquency are those rooted in religion, and based on attitudes

expounding the Protestant ethic and individual responsibility. At the dawning of the nineteenth century, a man named Beccaria set down the meaning of moral philosophy as it related to crime. He claimed that man, in the exercise of his free will, will seek pleasure and avoid pain. It is from such beliefs that the system of criminal punishment was derived: punishment must be greater than the real or expected rewards for a criminal act.

Biological theories. Another early view contended that antisocial behavior was due to organic or functional pathology of the central nervous system. Some studies have indicated that delinquents may be physiologically immature, or that they are underreactive to painful or anxiety-producing stimuli (Lindner, 1942; Stafford-Clark, 1951; Lykken, 1957). Other studies (Knott & Gottlieb, 1943; Ostrow & Ostrow, 1946; Stafford-Clark, 1951) have suggested neurological immaturity as a causal factor, based on electroencephalographic studies of delinquents. Physical characteristics, such as body-type, at one time were thought to be associated with delinquency (Lombroso, 1918; Sheldon, 1949). Delinquency has even been blamed on heredity and defective intelligence.

There is much controversy regarding the role intelligence plays as a cause of delinquency. For a number of years many respected researchers, such as Sutherland (1924), have discounted IQ as a delinquency factor. However, Hirchi and Hindelang (1977) present a rebuttal to the view that IQ does not matter. In their review of delinquency research, they found delinquents to consistently score lower than nondelinquents on IQ tests. The problem is far from resolved. For instance, Goldfarb (1945) asserts that lower intelligence among delinquents is due to early deprivation, and data indicate that the range of intelligence in delinquents overlaps the range in the general population. The importance of IQ as a causative factor is hotly debated for several reasons, including: 1) the lack of consistent findings on the IQ differences between delinquents and nondelinquents, 2) the view of some regarding the low validity of IQ tests, or possible racial bias, and 3) the belief that low IQ is a spurious consequence of other factors, such as social class or deprivation, that are more likely to be root causes of delinquency.

Briggs and Wirt (1965) discount the studies that promote biological theory, claiming that "data from all such studies come from highly select groups and do not account for the substantial incidence of similar findings

in nondelinquent populations or substantial absence of similar findings in the general delinquent population." In general, biological theory has been accepted only to the point that it is hypothesized that any trait is a product of heredity interacting with the environment (Jeffery & Jeffery, 1967).

Psychological theories. The Freudian theory of personality development states that delinquent behavior is a result of abnormal mental or emotional stress. Improper balance among the libidinal instincts of the id, the reality principals of the ego, and the conscience of the super-ego is said to result in psychotic or neurotic symptoms. Other psychiatric explanations of why a person behaves antisocially include, among others, seeking punishment because of neurotic guilt feelings; acting-out against society as a result of displaced hostility; and reacting to imagined threat caused by displaced anxiety (Wirt & Briggs, 1965). These symptoms are attributed to faulty interpersonal relationships, especially those occurring early in life between the child and his parents.

The parent-child relationship is often viewed as the most critical factor in the development of a delinquent personality. Friedlander (1945) emphasizes the failure of super-ego development. Aichorn (1935) claims delinquency results from inappropriate family affectional ties, rejection, or smothering love. Weinberg (1954) states that "psychiatrists have emphasized the disjunctive relations in the family as instrumental to delinquency; have seen delinquency as a negative form of behavior either in terms of residual hostility acquired from interpersonal relations in the family, or as compensatory association for parental or familial rejection or indifference."

These views seem to provide a tenable theory of the cause of delinquent behavior. However, Briggs and Wirt (1965) claim the psychological explanation is more useful in designing programs of treatment and prevention than for developing useful methods of prediction. This view is not fully substantiated and there are those who feel that psychological theory should continue to be tested in prediction research. For instance, Stott (1960) suggests that prediction methods be based on ratings of behavior and personality rather than environmental or sociological factors. He reasons that behavior and personality are generally shaped by the sociological environment, and therefore should be more accurate prognosticators of delinquency. Socially maladjusted behaviors and attitudes "represent soundings taken at a later stage of the aetiological

process in that they pick out not merely the children in adverse environments but those actually effected by them."

Sociological theories. Sociological theory originates from the age of social Darwinism, when human behavior was claimed to be the result of learning and acculturation (Karpf, 1932), and when a breakdown of power in the social system (caused by economic or political factors) was believed to have caused cultural norms to lose their inhibiting influence over group and individual behavior. The result is a condition of normlessness or lawlessness, or in Durkheim's terms, anomie.

Cloward and Ohlin (1960) theorize that delinquency "is the result of unsuccessful efforts to achieve goals of the society legitimately (especially as they relate to money and power), thereby causing the individual to engage in nonlegal avenues to obtain material wealth and social status, to steal or be a part of assaultive gangs, or to retreat from social participation through drug addiction."

Cohen (1955) contends that much of the senseless destructive behavior of youth is the result of the rejection by lower class youth of middle class norms, following what the child perceives to be a rejection of him by middle class authority. Miller (1959) went further by saying that lower class delinquency was "normal" and a consequence of lower class training for a life in that class. Elliott (1966) labels this concept "status deprivation." He explains that the intense frustration experienced by lower class boys when competing for rewards in a middle class society "provokes" them to turn toward antisocial means of obtaining goals. This is said to be especially true in the school situation, where due to their inability to compete under middle class standards, they feel insecure and frustrated. Delinquency is one result of such status deprivation. Dropping out of school is another means of expressing rejection and disdain for a set of standards which does not provide reinforcing events for lower class youth.

Marwell (1966) and May (1972) have taken a close look at the particular roles forced upon both the adolescent and the lower class members of society. Marwell, in particular, wonders if "there is something about the condition of adolescence which underlies this type of behavior [delinquency]. One possibility is that biological maturation is itself the crucial variable." He feels it is the adolescent's relative lack of social power that contributes

towards antisocial reaction. He defines social power as "the ability to get what one wants." May's definition of powerlessness is somewhat broader, entailing an inability to count for something, to have an effect on others, or to gain recognition for oneself.

Briefly, Marwell explains that young children structure the world around them through their parents, who are the providers of all needs. At about age 7 or 8, the child is forced by maturational and social demands to begin to fend for himself. He must get his own grades in school; he must protect himself from others outside the home, etc. This begins the process of "satellizing" loyalties to others besides the parents: for instance, teachers or powerful peers. In adolescence, children are forced to look to each other rather than the adult community for social rewards. As peer relations grow in importance, it is possible to interpret some delinquent acts as attempts to gain status or power. Other delinquent acts seem to be a form of rebellion or demonstrations of power against parents in particular and adults in general.

One other sociological theory has some prominence. Sutherland (1947) claims that a person may become delinquent through association with other persons of delinquent orientation. The delinquent is seen as a deviant type who becomes acculturated to an antisocial behavior system through association with other delinquents. Sutherland's "differential association" theory contains many elements of modern learning theory. His theory's propositions, in part, state that criminal behavior is learned, and learned primarily through associations with others within intimate personal groups, and that a person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law.

Although sociological theory has done much to demonstrate that delinquency is a learned rather than inborn behavior, the question remains, "Why do some persons who are equally subject to these negative factors <u>not</u> become delinquent, and why do others become delinquent in the relative absence of these same factors?" This is a phenomenon that will have to be taken into account in developing any prediction method.

<u>Relationship of Theory of Prediction</u>

Knowledge of the various delinquency theories and their individual validity is requisite in order to construct a method of identifying those children who will eventually become delinquents. A number of the theories described above

have been empirically tested and found lacking in validity. Furthermore, the subjective or abstract nature of some of the theories do not allow for scientific measurement or empirical validation. It must be kept in mind that it is highly unlikely that any one theory can explain delinquency.* Theories of delinquency causation should be considered to be building blocks for constructing a prediction scale. Theories provide indications of what to look for in selecting variables that predict delinquency.

The Role of Prediction

The importance of prediction in criminology has long been recognized. Almost twenty years ago, Kvaraceus and Miller (1959) wrote that there were two major approaches to prevention. One approach entailed strengthening of all the community forces that enable and sustain healthy growth and development for youth. The second involved "the early identification and detection of the 'predelinquent,' or the youngster who through cultural influences and/or personal make-up becomes vulnerable, exposed, or susceptible to a pattern of norm-violating behavior." Two of the pioneers in delinquency research, Sheldon and Eleanor Glueck, have said that "predictability is the most fruitful concept to have emerged in the history of Criminology. Determination of the traits and social influences most markedly differentiating children who remain nondelinquent from those who are probably predelinquents, and offenders who respond satisfactorily to one or another of the methods of correctional treatment from those who continue to commit crimes, is both a rational and effective approach to the practical problems of prevention and therapy" (1972).

Venezia (1971), in his paper on delinquency prediction, argues strongly for "systematically studying children in need of help--those who display danger signals at an early age. These are the children who are likely to experience increasing difficulties, with a concomitant handicapping of their potential. The need at this point is for a practical, acceptable, and efficient means of screening large numbers of young children." Jesness states "The basic rationale for an early identification and intervention program is that

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*Also, in statistical terms it is equally unlikely that one independent variable can account for a significant proportion of the variance.

there is a greater possibility to effect behavior change, with more economy of resources, if the intervention occurs before patterns of delinquency are well established" (1971).

The development of an effective method of predicting (identifying) delinquent-prone children would answer both needs described above. Such a prediction device would allow screening of large numbers of children, identifying those requiring some form of intervention, and at an age early enough to increase the possibility of modifying behavior or alleviating delinquency-causing factors.

Historical Review of Prediction Research

This section presents a survey of research in prediction of delinquency. The list of studies presented, while perhaps not exhaustive, contains the more well-known. The first study of variables that might predict parole success was published in 1923 by S. B. Warner, conducted for the Massachussetts Department of Correction. It was used by the Board of Parole to determine whether or not to grant parole. The Board had traditionally evaluated such variables as an inmate's conduct, whether or not he had employment waiting for him, whether he had a proper home to go to, etc. Warner asserted that these variables did not distinguish between violators and nonviolators in his sample. For a period of 30 years following Warner's publication, studies in prediction were primarily concerned with the future conduct of adult prisoners for the use of parole boards, and were used only occasionally with juveniles.

Other researchers utilized Warner's data and, using more powerful statistical methods, found that a number of other variables were associated with failure on parole. The most important of these variables were related to home environment, the prisoner's "character," and his physical conditions. It was Hart, in a 1923 study of Warner's findings, who first suggested that all the significant factors should be combined into a prognostic score for each prisoner.

According to Glueck and Glueck (1959), the first important prediction study was conducted by E. W. Burgess of the University of Chicago in 1928. Studying data collected on 3,000 males prisoners, he found that different parole violation rates were achieved by men grouped into categories on

several variables, such as committing offense and work history. Burgess was the first to assign weights to individual variables, and he did so in a very simple manner--a weight of one was assigned when the subject fell into a characteristics category for which the demonstrated failure rate was less than the general rate of violation. If the subject had a characteristic of a group with a rate higher than the general rate, no weight was given; therefore, Burgess' scale was intended to predict success on parole. The "Burgess method" has since become one of the most widely used techniques in prediction, although it has been criticized for several reasons. For example, some categories (there were 21 in all) were overlapping, some were too subjective and all factors were assigned equal weight even though some were more strongly correlated with success or failure.

It was also in the 1920s that the Gluecks began their followup and prediction research. In their initial work, "500 Criminal Careers," in an attempt to identify predictors of criminal behavior they studied the life histories of all prisoners released from the Massachussetts Reformatory whose sentences expired in 1921 and 1922. Their work differed from that of Burgess in that they did not rely solely on information contained in official records. They supplemented these data by interviewing the subjects and their families, a procedure innovative in prediction research at that time. Included were data on the family, personal and social background, prior criminal experience, physical aspects, behavior, occupational history, institutional factors, and parole and post-parole history. Their technique of deriving weights for variables based on their statistical relationship to recidivism was also an innovative feature absent from prior studies. This weighting technique also had deficiencies, however, in that some factors having low correlations with recidivism might nevertheless have been responsible for initial delinquency (or problems that ultimately led to delinquency). The Gluecks continued their prediction work for over 30 years, looking at new samples, new variables, and using new statistical techniques. In 1959 they published "Predicting Delinquency and Crime," a work containing a series of prediction tables for various categories of subjects, including predelinquents. More will be said about these tables later in the report.

Other contributors in the field of prediction research have been George B. Vold, University of Minnesota, who studied both Burgess' technique of

using the weights of all available factors and the Glueck's system of using the weights of only a few of the most significant factors (Vold, 1931). Elio D. Monachesi, University of Minnesota, published "Prediction Factors in Probation" in 1932, the first study using probation samples. His study resulted in 50 factors purportedly useful in predicting probation success among juveniles. Clark Tibbetts also investigated prediction factors among juveniles, finding the most significant to be offense history (first offender vs. recidivist), type of neighborhood, and work record. Lloyd E. Ohlin, working for the Illinois Department of Corrections, built upon the work of others using more sophisticated statistical analysis. His technique avoided complicated scoring and weighting procedures and did not utilize the interview due to the high cost involved. Ohlin's table showed a 36% increase in accuracy of prediction over tables designed by his predecessors.

In 1951, Morris G. Caldwell of the University of Alabama published a prediction study utilizing only 5 factors: occupational status and four offense history factors. Albert L. Reiss, Jr. continued this type of research which is based on the hypothesis that a small number of stable predictors is likely to yield the greatest accuracy. He was among the first to attempt to validate his prediction formula by applying it to a second (validation) group of study subjects. The five factors used by Reiss were: (1) family economic status, (2) truancy, (3) school deportment, (4) personality controls (inadequate ego vs. super-ego control), and (5) treatment recommendations. Some of these items are highly subjective but, within his study, were found to be reliable.

Kvaraceus (1954) developed a prediction scale, the Kvaraceus Delinquency Proneness Scale and Checklist, by selecting items from research literature that had been found to be significantly related to delinquent behavior. He ended up with a list of items having to do with family relationships, home conditions, location of residence, socioeconomic status, truancy record, school retardation, academic aptitude, school grades, liking for school, immaturity, club membership, companionship, and family mobility.

In developing his method, Kvaraceus relied on the literature to determine which responses should be labelled delinquent and which nondelinquent. He tested his pool of 75 items on an identified group of delinquents, a sample of high school students, and a sample of "high morale" students (those considered to be scholastic leaders). For each response in the delinquent

direction, the subjects received a score of one. The results indicated considerable difference between the scores of delinquents and the high morale group, with only 3% of the delinquents scoring below the mean of the high morale group. Less striking but nevertheless significant differences were found between the scores for delinquents and the regular sample of high school subjects. Findings were similar for boys and girls.

Kvaraceus (1954) criticizes early studies, such as the Gluecks' "One Thousand Delinquents," for describing characteristics of delinquents without having investigated the degree to which these same characteristics are present among a control sample of nondelinquents. Even when control groups have been used, he cautions against making generalizations since most studies have used very specialized samples as delinquent study groups. Some have used institutionalized, hard-core delinquents, whereas others have used juvenile court cases or referrals to child guidance clinics. He states that care should be taken in defining the delinquent and conclusions should be applied only to the particular type of delinquent studied.

Most prediction scales have attempted to identify those youths likely to become involved in any type of subsequent delinquent behavior. Others have attempted to predict specific illegal acts. Dentler and Monroe (1961), in a study of 912 seventh and eighth grade subjects, devised a scale to predict delinquency by type of offense, in this case, theft. Criterion data were in the form of a self-reported scale of deviant behaviors. Self-reported delinquency was correlated with other variables such as peer group status, extra-curricular activities, self-concept, and community differences. Subjects were then classified according to their scores on a five-item theft scale. The results showed high theft scores to be associated with age, sex, birth order, parent-child relationships, and leisure activities but not with socioeconomic status, type of community, family intactness, peer group status, or self-concept. While theft was correlated with other deviant acts, knowing that a subject had scored high on the theft scale did not increase the efficiency of predicting other forms of delinquency, leading authors to speculate that "some types of deviant acts are associated, while others are not, and that associations may vary with age, and that differences are substantial enough to require separate scales for certain hypotheses." This study does not present conclusive evidence that types of delinquent behavior should be

predicted individually, but it does raise the legitimate question to whether all antisocial acts share the same etiology. In other words, if a scale can be developed that will accurately identify those subjects with potential for committing property crime, will it also have efficiency in identifying potential assaultive subjects or drug offenders? It may be unreasonable to assume that one "all-purpose" prediction scale can be devised that will predict every variety of antisocial, delinquent, or maladaptive behavior. However, other studies have shown that most delinquents do not "specialize" in any particular type of delinquency (Robins, 1966; Woflgang, 1973).* This argument should be kept in mind by those doing prediction research.

Glueck Social Prediction Scale

The prediction studies based on the work of the Gluecks have generated the greatest response in the literature, both positive and negative. In 1950, "Unravelling Juvenile Delinquency" was published containing an analysis of some 400 variables on a sample of 500 delinquents and 500 nondelinquents. It was considered likely that among the variables that distinguished the two groups were some that were operative prior to the time of school entrance. This hypothesis led to the attempt to develop prediction tables that could be used on young children (as young as 6) for the purpose of identifying those with predelinquent tendencies.

The Gluecks selected five variables which best differentiated delinquents from nondelinquents: (1) discipline of boy by father, (2) supervision of boy by mother, (3) affection of father for boy, (4) affection by mother for boy, and (5) cohesiveness of family. These factors were each divided into subcategories and delinquency rates were calculated for children falling into each category (see Table 2). The scoring system involved determining the subcategory on each variable to which an individual belonged, and summing the delinquency rates for the subcategories of the five variables. For instance, on the factor "supervision of boy by mother," for those boys for

*Researchers are not always clear on this matter. Although Wolfgang (1973) concluded that the knowledge of type of prior offense is of little help in predicting type of future offense, he does admit that there existed in the youths in his sample "a moderate tendency to repeat the same type of offense" (p. 407).

whom supervision was rated unsuitable, 83.2% were in the delinquent group. Therefore, 83.2 would be the assigned weight on that variable. Where supervision was rated suitable, only 9.9% fell in the delinquent group, and 9.9 would be the assigned weight for boys with suitable supervision by the mother.

Table 2

Glueck Social Prediction Scale

Predictive Factors	Weighted Scores*
1. Discipline of Boy by Father	
Firm but kindly	9.3
Lax	59.8
Overstrict or erratic	72.5
2. Supervision of Boy by Mother	
Suitable	9.9
Fair	57.5
Unsuitable	83.2
3. Affection of Father for Boy	
Warm (including overprotective)	33.8
Indifferent or hostile	75.9
4. Affection of Mother for Boy	
Warm (including overprotective)	43.1
Indifferent or hostile	86.2
5. Cohesiveness of Family	
Marked	20.6
Same	61.3
None	96.9

*Percent of children rated in this category who were delinquent.

The Gluecks have said that the prediction of predelinquents consists of the "...timely detection of incipient antisocial attitudes and behavioral tendencies in children whose home situation is unwholesome" (1972). In addition, they assert that an instrument for identifying predelinquents can be of only limited value if it does not furnish clues to treatment needs.

They believe that their scale provides clues for appropriate treatment. For instance, lack of family cohesiveness may be remedied through tactful social work, temporary financial support, or intervention of a family guidance counselor or clergyman. Lack of parental affection can be attacked on an individual case approach, determining and alleviating specific causes. Counseling and educating parents regarding family disciplinary practices can be another indicated treatment. Improvement in any one of the five areas can improve a youth's prediction score and increase his chances of avoiding becoming delinquent.

Elmering (1972) reports on a number of cross-validation studies of the Glueck prediction scales. He reports studies showing success in retrospectively identifying those who eventually became delinquents in a variety of populations: 91% among 100 Jewish boys; 81% among unmarried young Jewish mothers; 89% among delinquents from middle income homes; and 91% among a sample of 100 boys who had been part of the Cambridge-Somerville Study. The scale predictions among the latter group were more accurate than the prognoses made by a team composed of a psychiatrist and a psychologist.

These high rates of correctly identifying delinquents may sound encouraging. However, Elmering does not report on the false positives--those subjects the scale identified as delinquents but who did not become delinquents. One of the primary criticisms of the Glueck table has been that the percentage of delinquent "hits" is so high because it overpredicts delinquency in the population. In other words, if you call enough children predelinquents, you are bound to identify most of those who become delinquent.

Briggs and Wirt (1965) have defined the primary weakness of the Gluecks' work to be their failure to incorporate true base rates of delinquency into the predictive system. Delinquents and nondelinquents represented equal proportions in their sample, and this is not true in the general population. The severe form of delinquency used to select delinquents for their sample further restricts the generality of the results. A third criticism is that the study was done retrospectively, with known delinquents. This fact may have caused some contamination in the ratings made of the subjects by the interviewers. In addition, use of the Glueck scale is often inappropriate because some variables refer to the total family constellation; many families in target neighborhoods have but one parent. Collecting the information

necessary for the Glueck scale is also considered costly and time-consuming. And finally, Briggs and Wirt question the advisability of predicting within the six-year-old group. They contend that twelve-year-olds may represent a better target group, since at age 12 children tend to be on the threshold of delinquency.

Another criticism has been the absence of Negroes in the Gluecks' study population. To determine if the Glueck scale is valid with Negroes, Kramer (1972) conducted a study on a sample of 261 blacks in a lower class district of Washington, D.C., in which blacks comprised 90% of the population. In this particular district, the delinquency rate was 35%, a figure closer to the proportion (50%) of delinquents in the Gluecks' construction sample, thereby removing some of the base rate problem. The sample was composed of three subgroups: 87 mildly delinquent boys from a children's center, 87 serious delinquents from a training school, and 87 nondelinquents from the same highly delinquent district of the city. The Glueck scale proved "exceptionally powerful in its discriminating effect," and the conclusion was that the scale was equally valid when used with Negroes.

Other findings from this study are of interest. The California Personality Inventory (CPI) was administered to the subjects and discriminating items were identified. Only five items significantly differentiated among the groups, four of which involved family harmony.* The fifth item asked if the boys tried to keep out of trouble, answered true by nondelinquents. Kramer asked the subjects if at least one close friend in their neighborhood had been arrested. The statement was marked true by 63% of the nondelinquents, 70% of the mild delinquents, and 74% of the serious delinquents. Although the differences are in a direction supportive of the differential association theory, they are not significant. Obviously, in this highly delinquent neighborhood, the nondelinquents almost as often had delinquent friends as did the delinquents.

Based on his findings, Kramer suggests that in environments of the type studied in Washington, D.C., where deprivation and degradation are prevalent, the family seems to be the only institution for effective social control and

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*Since there are 480 items on the CPI, finding significant differences on five items is not impressive, and may indeed have been the result of chance alone.

external strength. When the family atmosphere is defective, the path to delinquency may be unavoidable to the children. Therefore, it would seem that evaluating the family when the children are yet young is the most effective method of predicting who may become delinquent.

Three Well-Known Prediction Studies

Among the most familiar prediction studies are the New York City Youth Board Prediction Study and the Cambridge-Somerville Youth Study. These studies attained prominence because they were, and to this date continue to be, the only true prediction studies (as opposed to postdiction) presented in the literature. Postdiction means determining the causes of delinquency after the fact; subjects are identified as delinquents or nondelinquents and statistical analysis is used to identify those variables more highly associated with the delinquent subjects. Prediction involves selecting a random sample of subjects, analyzing some set of theoretically and/or empirically pertinent factors, identifying those subjects who are potential delinquents, and conducting a longitudinal followup at some later point in time to determine the accuracy of the initial predictions. Postdiction and prediction types of validation studies are also called retrospective and prospective, respectively.

The New York City Youth Board Prediction Study. One of the first attempts to conduct a prospective study was the New York City Youth Board Prediction Study. The Youth Board undertook the study to determine if predelinquents could be identified at age 5 or 6. Identified delinquents were to be sent to a school child guidance center where various treatment approaches would be tried in an attempt to counteract the delinquency predictions. Researchers Craig and Glick (1968) administered the Glueck Social Prediction Scale to all boys entering first grade during 1952 and 1953 in two schools in a high delinquency area of New York City. The sample consisted of 301 boys, 57.4% of whom were Negro or Puerto Rican. The study design called for a followup of all boys to their 17th birthday, the limit of juvenile court jurisdiction. The initial ratings of delinquency potential were unknown to all but the researchers, removing any possibility of stigma due to labeling.

Initial difficulties were encountered in making the Glueck scale ratings. Rating cohesiveness of one-parent families presented a special problem among Negro families, many of which contained only one parent and were often matriarchal

or mother-centered. In addition, the raters often lacked confidence in their ratings of discipline and supervision in the boys' family relations at age six (the Glueck sample, recall, ranged in age from 11 to 17). The original ratings resulted in a proportion of boys rated as delinquent greater than the base rate of delinquency in the area. The one-parent families were reevaluated, and a few ratings were changed from delinquent to nondelinquent after more positive ratings of cohesiveness were assigned.

Because the proportion of delinquents was still too high, Glick asked the Gluecks if the two items on affection could be dropped, since interrater reliability on these two items was quite low. The Gluecks performed some cross-correlational studies on their own data and concluded that a three-factor scale would provide as good a result as the original five-factor scale. The three-factor ratings of the sample showed a high probability of delinquency for 11% of the cases, much nearer the actual community rate.

The results of the followup showed that 84.8% of the predicted delinquents had in fact become delinquents by age 17 (5 of the 33 predicted cases were false positives, that is did not become delinquent). Of the predicted nondelinquents, 97.1% remained nondelinquent (7 of 243 predicted cases were false negatives, that is, became delinquents). Of the 25 boys whose ratings suggested an even chance of becoming delinquent, 16 remained nondelinquent. The overall "hit" rate was 95.7% and only 12 of 276 predictions were wrong.

Comparisons were made among the families of delinquents and nondelinquents. Factors found to be more often associated with the delinquents' homes were: (1) broken homes, (2) delinquency among parents and siblings, (3) illegitimacy of children, (4) receiving financial assistance, and (5) more contact with social agencies.

It was concluded that delinquency was only one symptom, among many, of a disorganized and deteriorated home situation. A high relationship was also shown between ratings on family factors and showing problems in school. Of boys whose parents were lax or inconsistent in their discipline, 81.6% exhibited acting-out behavior in school.

In Glick's study, the school behavior of the children was closely monitored for ten years. Of those who later became delinquent, 79.5% first manifested behavior problems in the first, second, or third grades (59.1% in the first grade). Only 27.3% of the nondelinquent sample showed problems during their first three years of school. The longitudinal study of school behavior

indicated that there was a qualitative as well as quantitative difference. The boys who were later to become delinquent were more aggressive, defiant, rebellious, and hostile; they behaved as bullies and fought with younger children; they disliked school and evidenced academic retardment (especially in reading and arithmetic). Problems of predicted delinquents who remained nondelinquent were of a different nature: constantly talking, seeking attention, engaging in horseplay, and they were generally considered difficult to manage in school. The problem for teachers is in determining when episodes of classroom misbehavior are temporary manifestations (part of growing up, testing limits, etc.) or symptomatic of a kind of pathology which will grow increasingly serious, ultimately resulting in delinquent behavior.

Kahn (1965) is a severe critic of the Youth Board Study results. He contends that the study did nothing to validate the Glueck scale, that the statistical interpretation of the predictive efficiency of the findings is exaggerated, and that there is no evidence to show that the identified predelinquents had been helped in any way. He reasons that the Youth Board Study was not an experimental validation, which by definition must follow standards of reliability, validity, precision, and statistical significance. He emphasizes the restriction that "the rules of the game may not be changed en route." He claims that the original experimental design was perverted into an exploratory study. The prediction scale was modified several times during the study and, Kahn asserts, eventually became a prediction model designed to fit a particular population. As a result, the device was not a prediction method based independently on the Glueck scale and failed to serve as a prospective test.

The Cambridge-Somerville Youth Study. This study is a forerunner among prospective prediction studies. The sample consisted of 650 boys aged 6 to 12 who resided in two Massachussetts cities. Some were regarded as predelinquent, others as normal or doubtful. Part of the study included analyzing the effects of various levels of treatment on outcomes. Three kinds of prediction measures were used: (1) prognoses of future delinquency made by a committee composed of a psychiatrist and two penal administrators based on case file studies, (2) teachers' prognoses, and (3) a behavior rating scale. The predictions were made during 1937-1938 and outcomes were recorded nearly 20 years later. The predictions of the committee correlated with outcomes .49,

those of the teachers, .48. The behavior ratings were said to be able to differentiate the most delinquent from the least delinquent cases.

In his critique of this study, Toby (1965) considers the prediction effort quite unsatisfactory. The method used resulted in overprediction of delinquency: of 305 boys for whom delinquency was predicted, 191 or 63% did not become delinquent. More success was achieved in identifying non-delinquents: only 18, or 12% of the 150 predicted nondelinquents subsequently committed offenses.* Toby made an analysis of the reasons for the overprediction of delinquency and found that the ratings were correlated with type of neighborhood: predictions of delinquency were frequently made on boys from slum neighborhoods but seldom if boys came from "good" neighborhoods. This apparent bias probably affected the accuracy of the predictions and, Toby concludes, "...an obvious possibility is that a considerable amount of delinquency goes unrecorded. If this 'hidden delinquency' could somehow be put into the record, the predictions might well seem more accurate."

Hathaway and Monachesi Study. One of the largest samples available for a prediction study was that obtained by Hathaway and Monachesi (1957). Beginning in 1947, a self-report personality instrument, the Minnesota Multiphasic Personality Inventory, was administered to ninth grade students in Minnesota schools. By 1954, extensive information was available on over 15,000 children. Various measures were obtained in addition to the MMPI, including teacher ratings on the likelihood that a child would have legal or emotional difficulties. Outcome data were obtained during a ten-year followup. A system of coding was applied to the MMPI scales to obtain delinquency prediction scores. In addition, the 550 individual items were examined and those significantly differentiating delinquents from nondelinquents were combined into a prediction scale. Neither form of prediction method based on the MMPI proved successful (Wellford, 1967; Briggs & Wirt, 1965).

The ratings of teachers were equally disappointing. Teachers tended to over-select as predelinquents children from lower socioeconomic classes and those with low academic performance. They seldom predicted delinquency among children with good grades, and their predictions were inaccurate when they

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*But more success would be expected when predicting the more commonly-occurring event. This is another example of the base rate problem.

did choose one. The results showed that teacher predictions of delinquency were 54% accurate among children from professional and semiprofessional families, and only 30% accurate among farm boys. The accuracy of the teacher predictions may well have been hampered by the fact that, while several teachers were asked to nominate students likely to get in trouble, a student's name only had to appear on the list of a single teacher to be identified as a predelinquent. A composite of the ratings of all the teachers may have proven more accurate, in part because it would remove the possibility of individual teacher bias.

The Pros and Cons of Prediction

Pro. "Prediction, a traditional aim of science, is a requisite to any effective crime and delinquency prevention or control program. If we seek to control delinquent and criminal behavior, then first we will need to be able to predict it" (Gottfredson, 1971).

Con. "There is still no evidence that the prediction [of delinquency] actually helps schools, communities, or families in any way since no test has been reported and successfully completed involving use of the predictions to help children. On the other hand, a good deal of social-psychological theory suggests that the prediction may harm rather than help if it results in application of a negative label to the child" (Kahn, 1965).

The two opposing viewpoints presented above portray the extent of the radical controversy regarding the efficacy of delinquency prediction. Those in favor consider prediction to be a necessary tool in the delinquency prevention effort, claiming that the only way to prevent delinquency is to stop it before it gets started. Those opposed to prediction base their opposition primarily on the alleged deleterious effects of "labeling" a child with a predelinquent or delinquent-prone prediction. These issues will be discussed further in the following sections.

The Negative View of Prediction

Base rates and overprediction. Those holding the negative view of prediction claim that no study has proven it possible to identify the majority of children who will become delinquent without overpredicting, that is, identifying as delinquent-prone a large number of children who will not become delinquents, along with the potential delinquents.

Overprediction occurs primarily because of the low base rate of delinquency in the population. Delinquency rates vary considerably among different populations: from an estimated 4% among the total national adolescent population (Perlman, 1970), to an actual 35% among youths in Wolfgang's Philadelphia cohort. "Critics argue that a table which is based on a construction sample of which 50 percent were delinquents [such as the Gluecks] must not be applied to another sample with a significantly different rate of delinquents among its population" (Weis, 1974). Application of prediction tables that have been constructed on a sample with a 50% delinquency rate results in a successful prediction rate grossly inflated over what can be expected when prediction is made on a population containing a lower base rate of delinquency. Some researchers have claimed that the Glueck tables, if applied to the general population, would result in 90% wrong decisions. In fact, Weis reports a study undertaken at the Dallas Child Guidance Clinic in which the Glueck table correctly identified 92% of the delinquents, but also identified 77% of the nondelinquent cases as future delinquents. Scores or weights need to be adjusted to account for the percentage distribution of delinquency in the population in order to minimize statistical errors of this kind.

As attempts are made to predict progressively infrequent events, i.e., those in which the base rate of occurrence is decreasingly less than 50%, it becomes increasingly difficult to make accurate predictions. For instance, the Jesness Inventory (Jesness, 1972) contains a delinquency proneness index which has been shown to correctly identify 87% of the true positives among a sample of girls when the base rate of delinquency is 50%. Both true positives and false positives are taken into account in the formula for a true positive. When the base rate is 20%, the index correctly identifies 63% of the true positives, and when the base rate is only 5%, only 26% of the true positives can be identified.

Because of the base rate problem, prediction may result in uncomfortably large numbers of "false positives," those falsely identified as potential delinquents. On the other hand, prediction also results in "false negatives"--those eventual delinquents not identified as such by the prediction method. Whether it is acceptable to tolerate some misclassifications "depends upon the context, the cost and consequences of intervention, and the consequences of not intervening. Where the cost of intervention is low and the payoff is high, one is willing to make more false positive errors" (Jesness & Wright, 1977).

Invasion of privacy and justice. Venezia (1971), although a proponent of prediction, warns of the possibility that "An actuarial statement that a given child has a high probability of future delinquent behavior (variously defined) carries with it the danger that it may be used to justify an intrusion into his life or family environment." Such a statement, however, smacks of mistrust of an Orwellian Big Brother. It is granted that intervention in any form "must be logically and morally a response to a child's current needs." In a situation where a child is experiencing problems that may lead to future delinquency, it is difficult to comprehend how the provision of services can be considered as invasion of privacy. A more realistic concern has been expressed that improper use of prediction could result in an infringement on the liberty of a citizen. Stott (1960) says it would be "socially invidious" for a judge to follow the Glueck procedure and award probation to or sentence to confinement an individual based on certain social characteristics, such as ethnic background or number of siblings.

Cost. The costs associated with prediction are discussed by Schur (1973) and Toby (1965). Toby says that one rationale of early intervention must be to economize treatment efforts, or else society would treat all youth to whatever resources are available for delinquency control in order to prevent all delinquency. However, in considering the cost-efficiency of prediction, he warns "If delinquency occurs in too many cases where nondelinquency was predicted or fails to occur in too many cases where it was predicted, economy may not be realized."

Schur asserts that errors in prediction are costly. He gives as an example a hypothetical instance where the cost of a delinquency prevention program is $200 per child. This amount is unnecessarily expended when applied to a false positive, an identified predelinquent who would not have become delinquent anyway. On the other hand, false negatives can be costly too. Assuming that an intervention program can be successful in preventing a youth from becoming delinquent, then a predelinquent that the system fails to identify for treatment will become delinquent and exact an even higher cost on society (cost to the victim, police handling, court costs, institutional costs, and of course, the loss to society of a potentially productive citizen who instead became delinquent).

Labeling. There is the belief that by identifying those youths who have the characteristics predictive of delinquency, in effect a "label" is placed on them. The social environment (e.g., teachers, counselors, juvenile justice staff, etc.) may respond differently to youths who have been labeled predelinquent and in fact the differential reaction may serve to cause youths to become delinquent. The American Psychological Association, according to Wellford (1967), has condemned prediction methods based on social variables (such as the Gluecks') not only because of methodological limitations, but also because of the danger that those given a label may in fact become what they have been labeled. This "self-fulfilling prophecy" associated with labeling or identifying predelinquents is a major objection to prediction.

Representative of this viewpoint is a statement by the Council of the Society for the Psychological Study of Social Issues regarding the NYC Youth Board Project: "Unless the utmost caution and care are taken, children who are 'identified' and labeled as probable future delinquents are likely to be treated and isolated as 'bad' children by teachers and others who are now subjected to the virtually hysterical climate of opinion concerning juvenile delinquency. Such treatment is likely to increase the child's sense of social alienation and, thereby, increase the probability of his becoming delinquent" (quoted in Schur, 1973). This would be especially tragic in the case of a false positive, a youth labeled as a predelinquent who, without having been labeled, would not have ever become delinquent.

Toby, in discussing the possible effects of labeling, avows that early identification, as a process in itself, does not necessarily imply stigmatization, "but early discriminatory treatment seems to" (1965). He believes that the danger is not the label itself and that even if negative reaction towards a labeled child can be prevented, placing the child in a special program or providing him with services his peers may not have access to, can impress upon the child that he is somehow different.

However, there is little research bearing on the validity of labeling theory, especially in regard to labels associated with delinquency. It remains controversial whether a delinquent label has an effect in causing a youth to be delinquent. Guskin, Bartel, and MacMillan (1975) conclude that it is not clear that "labeling has a distressing effect, nor is there evidence that labeling as such has a long-term effect on adjustment, self-concept, or

personality." Although primarily studying the effects of a label of "mentally retarded," their conclusions bear on labeling theory in general. It is their contention that impact on the self-concept cannot be attributed to labeling alone. They assert that classifications or labels are given in order to select persons in need of special services. Those whose behavior (or misbehavior) differs from that of the group are those that would likely be identified as being in need of services. Those so obviously in need of services have probably already been informally labeled by others and subjected to various forms of pressure and failure, and responded to differently prior to being formally classified. Kahn (1965) has said that the question of whether the status of being identified as a predelinquent is helpful or harmful remains a legitimate research issue that cannot be ignored by proponents of prediction.

Why Predict Only Delinquency?

A final objection has to do with the efficacy of developing methods that are limited to predicting a single event--delinquency. There are those who believe we are failing to do the most good by limiting the delivery of services to only the identified predelinquents. Kahn (1965) asks whether it would be more valuable to locate all children in need of help rather than potential delinquents. Making a decision regarding this question would depend on the goals and resources of the organization implementing a prediction process.

The Positive View of Prediction

What then can be said on the positive side of the ledger for prediction? First of all, we can hypothesize that effective prediction will enhance efforts to reduce the incidence of anti-social behavior and delinquency. Our approach to delinquency prevention, which utilizes little or no prediction methodology, presently shows little evidence of working. As the U.S. Senate report predicts, one million youths will enter the juvenile justice system in 1977 despite all our current efforts. In California alone, in 1976 there were over 350,000 juvenile arrests. Wolfgang has shown that it can be expected that one in three juveniles will be arrested at least once by age 18. Self-report data indicate that there is much delinquent behavior that goes unreported. In Haney and Gold's study (1973) of self-reported delinquency, 83% of their sample of 522 adolescents admitted to having committed an act for which they could have been arrested (only 11% were in fact arrested). On the Other hand,

it might be hypothetically argued that prevention is working, because if it were not for current prevention efforts the number of youths in trouble might be much higher than it is. However, such an argument cannot be supported with hard data.

It would be impossible to implement a nationwide network of prevention programs encompassing a segment of the population large enough to by chance include the estimated one million juveniles bound for trouble. Currently, the youths reached by prevention programs are among that small percentage who have already been arrested or in some fashion brought to the attention of the authorities. Dealing with these arrestees, who may not have been detected and arrested until they have already committed several delinquent acts, may decrease our chances of successfully blocking a delinquent career in the making.

Little data are available on the success of our prevention efforts, but the delinquency statistics suggest a discouraging view. If nothing intervenes in the progression of a youth's antisocial behavior until he becomes an adjudicated delinquent, he is then subjected to rehabilitative treatment programs. Is it wise to postpone intervention until it becomes necessary to place youths in institutional programs? Of the 4,055 youths released from California Youth Authority facilities in 1973, 44.7% violated parole within 24 months (Youth Authority Annual Report, 1975). The parole failure rate for those subjects having been committed to a CYA facility more than once is even higher. In addition, the cost of a CYA commitment is extremely high. If we continue to operate delinquency prevention programs we must better utilize available resources by intervening only with those youths whom we can predict, with some acceptable degree of certainty, will engage in repeated delinquent acts.

Prediction instruments can be used to identify an individual youth's problem areas that, if left unattended, might lead to delinquency. The early identification of these problems can govern the selection of the appropriate type of treatment program, the one (or those) with the greatest chance of successfully deterring a youth from becoming delinquent. Many therapists will argue that each youth has unique problems and that treatment must be individually designed. Toby (1965) points out that treatment agencies rarely provide individualized services, but rather treat each child to resources ideologically congenial to the agency (p. 162). As an example, Toby cites

the case where a youth would receive casework services if assigned to one agency, but receive group work if assigned to a different agency that specialized in group work or believed it to be the most successful approach to treating predelinquents. A utilitarian prediction method would indicate which of several kinds of intervention services are called for depending on which predictive factors were present.

In response to the criticism of prediction presented earlier, it can be said that there is little concrete evidence to support the claims of the labeling theorists. There has been no systematic measurement of the effect, good or bad, on false positives erroneously selected for intervention services. In fact, it may be hypothesized that services provided to false positives may result in ultimate good since most predictions of delinquency are based on the presence of negative factors: problems in school, interpersonal problems, difficulties within the family, etc. If a youth has any of these problems, whether he is actually a predelinquent or not, providing services would certainly be of benefit to the individuals, their families, and ultimately to society in general.

Prediction Methodology

This section discusses the attributes of the various methodologies of prediction. There are several techniques available in the development of prediction scales, as well as differing ideas about the appropriate age level of a target group when prediction will be most effective.

The various kinds of approaches to prediction include actuarial, clinical vs. statistical, path or chain analysis, regression analysis, and multivariate vs. univariate methods. There is, in addition, the question of whether prediction should be based on correlational variables or theoretically causative factors. By the latter it is asked whether variables put into a prediction scale should be selected simply because they tend to be correlated with delinquent behavior, or whether selection of variables should be based on some empirically supported theory on the causes of delinquency.

Statistical scales are similar to actuarial scales used by life insurance companies (Hemple, Webb, & Reynolds, 1976). Based on age, health, and other variables, life insurance companies can predict the percentage of persons within certain categories who may expect to live an additional 20 years. Similarly, given knowledge of pertinent variables, a statistically-based

prediction scale provides a probability statement regarding subsequent delinquency. This probability is usually referred to as a "risk category" or "base expectancy score."

A problem inherent with purely statistical scales is that they may lose their validity over a period of time. The statistics are derived from a criterion group based on its social experiences and the conditions prevailing at a specific time. If delinquency is believed to be caused, at least in part, by social conditions, then when those conditions change the delinquency rate changes, and the predictions become less accurate or reliable. Statistically derived prediction scales should be periodically re-validated on contemporary samples.

Clinical prediction is based on subjective data interpreted by a clinician or other trained professional. Subjective ratings of this kind are notoriously unreliable.* In Stott's opinion, subjective judgments "vary with the degree of insight and experience of the individual [rater], and of his or her understanding of the cultural traditions of the family" (1960). The NYC Youth Board Prediction Study used the Glueck Social Prediction Scale, which may be considered to be a statistical mode but one based on subjective ratings gained through interviews. In evaluating the predictive effectiveness of this study, Kahn (1965) comments that even if all the claims of the study were granted, all that we could be certain is that "we would know only that a highly skilled staff with a high level of foundation financing and infinite time to rate cases and reconcile differences can presumably train itself in reliable and valid use of a scale." The problems associated with clinical prediction, such as the unreliability of ratings and the high cost of collecting data, preclude their utility in prediction.

A prediction scale may be based on a particular theory of delinquency causation: e.g., delinquency is a result of poor affectional ties between parents and child. If the scale includes only variables that tap the dimension of family affection, it is a univariate method. This univariate approach overlooks two important factors: (1) not all children who experience inadequate parental affection become delinquent, and (2) it is unrealistic to believe that

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*Jesness (1974) refers to "research evidence indicating that a) the interview is an instrument of low reliability, and b) mechanical modes of combining data tend to be superior to clinical modes" (p. 9).

there is only one cause of delinquency. "Univariate predictions of delinquency represent grossly inadequate procedures in light of current statistical knowledge and computer capacities" (Feldhusen, Thurston, & Benning, 1973). It becomes obvious that prediction must be based on multi-dimensional scales.

Many researchers have relied on correlation as the statistical method used to select predictor variables. While correlation is a powerful technique when used appropriately, its misuse in selecting predictor variables can lead to ludicrous conclusions. In the 1950s, it was widely publicized that reading comic books was correlated with delinquency, based on a finding that the majority of delinquents read comic books; therefore, the conclusion was made that reading comic books led to or caused delinquency. The invalidity of this conclusion can be readily seen when one considers that most delinquents also drink milk, wear shoes, or listen to music currently popular among adolescents. According to Hirschi and Selvin (1966), "observing a statistical association between phenomena is only the first step in plausibly inferring causality." They recommend an improvement in the statistical approach.

Improved statistical approaches are available. Multiple regression analysis is one such technique of looking for causes of delinquency. Whereas single correlations look for a relationship between delinquency and other variables one at a time, multiple regression analysis allows for a large number of variables to be examined simultaneously, looking both at each variable's relationship to the dependent variable (delinquency) and at the interrelationships among the independent variables (predictors). Readers interested in a more complete description of regression analysis should consult McNemar (1969) or Cohen and Cohen (1975).

Another method of avoiding the pitfalls of simple correlational analysis is that of path analysis. Although not specifically designed to isolate causative factors, it may, asserts Duncan (1966), "be invaluable in rendering interpretations explicit, self-consistent, and susceptible to rejection by subsequent research." Path analysis was probably first used by geneticists in determining the relationship of heredity and environment to intelligence. In path analysis, the interrelationships among a number of factors is determined, e.g., it may be found that the presence of Factor A leads to the development of factors B and C, both of which may exist at the same time or only one may exist. If B is present, it may in turn lead to certain other factors,

characteristics, or events. If C is present, without B, the "path" may lead to a different set of outcomes. And if both B and C are present, yet another set of outcomes may be expected. Once again, the interested reader should refer to the work of experts (Duncan, 1966; Blalock, 1964).

Path analysis is a complex statistical technique, but the concepts it follows allow a multivariate approach to determining those factors predictive of delinquency. Univariate approaches take a single variable, such as family discord, measure it on some interval or ordinal scale, examine its relationship to delinquency, and attribute to family discord some power or assign it some empirically-derived weight as a predictor variable. The variable may be used alone or in an additive formula with other predictors. Nevertheless, the importance of the variable in predicting delinquency is reduced because its significance was established by evaluating the variable in isolation from other possible influences.

A multivariate approach such as path analysis assumes that a specific variable may contribute towards delinquency with varying power, depending on the presence or absence of other contributing or interacting variables. As a hypothetical example, family discord may correlate with delinquency at a .25 level, meaning that family discord alone would not be a very powerful predictor. But if along with family discord other correlated variables are also present, such as severe parental discipline or problems in school, the strength of the relationship might be increased. The idea that a number of variables, each resulting from or contributing to another, may ultimately produce delinquency needs further empirical research.

Such research is already underway. Polk (1975) has proposed a causal sequence that theoretically leads to delinquency: vulnerability to school failure → → low academic performance → → involvement in an antisocial teenage culture → → troublesome behavior → → delinquency (the arrows are read as "leads to"). However, this theory overlooks research that has indicated the importance of family disorganization in the sequence.

Wright (1977), based upon his research in the Grant School Delinquency Prevention Project, builds upon previous theory and hypothesizes the following causal sequence: Family disorganization → → personal maladjustment → → academic incompetence and failure → → troublesome behavior → → negative school response → → involvement with delinquent peers → → chronic delinquency. It

is Wright's intention to use various multivariate approaches to determine the validity of this set of causation-predictor variables.

Implementation of Prediction Methods

The preceding section briefly described several statistical methodologies available in prediction research. This section considers the more practical aspects of prediction: (1) what should be predicted, (2) at what age prediction should be applied to youths, (3) what method or set of predictor variables should be used, and (4) what should be done as a result of prediction information.

What to predict. Most frequently, a prediction method attempts to identify those subjects who will be arrested for illegal behavior. This criterion has merit because it is an easily defined standard measurement and its use allows successful prediction rates to be compared across time periods or among groups.* Appearance in juvenile court is another measure sometimes used when it is wished to identify more serious delinquents. By using court appearance, it is possible to increase the accuracy of prediction. Feldhusen, et al. (1973) were able to predict police contacts (postdictive) with 69% accuracy using as predictors a combination of background, behavioral, and psychological variables. Accuracy increased to 76% when they attempted to predict court appearance. When predicting court appearance, you are eliminating the casual or less serious delinquent episodes where police make informal dispositions or, if referred to probation, are handled informally by the probation department.

Self-reports of delinquent behavior can also be used as a criterion. However, the use of self-report measures of delinquency has some drawbacks because of the lack of, or difficulty in obtaining, self-reported delinquency data from comparison groups. Self-report data are most useful when the evaluation goal is to determine the effect of intervention (or diversion) within a specified sample of clients. Official arrest data become more relevant when

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*It is recognized that law enforcement and court policies may vary slightly among different jurisdictions. Because of these slight legal variations, it may be best to use arrests rather than convictions to minimize differences. The use of arrests also increases the base rate of the event being predicted. It should be remembered that the more infrequent the event being predicted, the less accuracy can be expected from a prediction method (recall the earlier discussion of the base rate problem).

it is desired to measure local delinquency rates on a before-and-after basis or to compare rates with other groups. To be avoided is the use of criteria with low reliability of measurement, such as "problem behavior" in the family, school or community. Problem behavior, like the term "incorrigible", means different things to different people. What is desired is stability in the criterion. This may be partly achieved by attempting to predict chronic offenders--perhaps those with three or more arrests.

When to predict. The choice of the criterion to be predicted is also dependent on when the predictions are to be made, that is, the age and nature of the target group. With older adolescents, who already have an arrest record and may be on probation or parole, it may be satisfactory to predict a single subsequent arrest (and past arrest history would become a powerful predictor variable). However, with younger children it might be more beneficial and practical to predict who will become chronic offenders.*

Briggs and Wirt (1965), reporting their own earlier research, state "judged severity of crimes committed by adolescents varies from age to age. Thus, one would wonder whether a prediction of delinquency must specify crimes at a particular time." Kvaraceus and Miller (1959) describe three levels of "readiness" for delinquent behavior on the basis of which forecasts of future delinquency can be attempted. At level one are those youngsters who have not yet engaged in delinquent behavior but because of the presence of certain indicators in their personal adjustment or social milieu, are potentially vulnerable to eventual delinquency. Prediction at this stage is difficult because it involves forecasting events at some distant future point. Prediction can only be accurate if the presence of the delinquency indicators remains constant. Any change in conditions, such as the influence of a teacher, a move to a different neighborhood, or remarriage of parents, can effect the child in such a way that nullifies the delinquency prediction.

At level two are youngsters who have already become engaged in problem behaviors such as school misbehavior, minor vandalism, or association with

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*Recall Wolfgang's data, which indicate that many of those who commit a first offense never commit a second. Attempting to predict who will commit a first offense may not only be extremely difficult, it might also increase the potential problems associated with false positives and labeling, and may also overload prevention programs with youths who may only commit one offense and "go straight" at any rate even without intervention.

undesirable peers. Prediction at this point can be more successful in identifying those subjects likely to advance to more serious norm-violating conduct in the near future. However, there is the question of how effective intervention can be once problem behaviors have become manifest or firmly established in a youth's behavioral repertoire.

At level three are the youths who have frequently engaged in delinquent acts but who have not yet been detected or adjudicated. A prediction of delinquency (in the form of a police contact) is probably very accurate for these youths if they continue their undetected illegal behavior.

The younger a child is when he is identified as a potential delinquent, the greater the possibility of effecting behavioral change. Craig and Glick (1968) found that the majority of boys who eventually become delinquent evidence problems in the early grades at school. Their findings on 301 boys in the NYC Youth Board Study are shown below:

Table 3

Craig and Glick Data

First Year That Boys Presented Problems to Teachers

First School Year Behavior Reported as Problem	Total Boys	Percent of Total	Non-Delinquent		Delinquent	
			n	%	n	%
Total Sample	301	100.0	257	100.0	44	100.0
No Problems Reported at End of 3 Years	196	65.1	187	72.7	9	20.5
Problems Reported at End of 3 Years	105	34.9	70	27.3	35	79.5
Problems in Grade 1	54	17.9	28	10.9	26	59.1
Problems in Grade 2	27	9.0	21	8.2	6	13.6
Problems in Grade 3	24	8.0	21	8.2	3	6.8

These data are of importance in establishing both when to make predictions and upon what population. The most comprehensive intervention effort would include assessing (making predictions on) all children, but it is unlikely we have the time or resources for such an all-inclusive program. From their data, Craig and Glick suggest that the prediction process be applied only to those children showing problems in the elementary grades. Of the 196

students in their study who did not exhibit any problems in the first three years of school, only 9 (4.6%) became delinquents. A total of 105 students had shown problems, and all of these could probably have benefitted from some type of supportive services even though only 35 (33.3%) became delinquent. Applying prediction methods to those 105 cases showing school problems could have possibly identified the majority of the 35 potential delinquents, to whom more intensive intervention services could have been provided. On the other hand, such a procedure would have overlooked the nine boys who had not shown problems by the end of the third grade but eventually became delinquent.

However, as already mentioned, predictions made on very young children, such as those attempted by the Gluecks and Kvaraceus, are likely to be less accurate due to the possible positive effects on the child of changing conditions in his environment. This is confirmed by Toby (1965), who says "Accurate early identification is possible only if no crucial etiological factors make their appearance after the predictions are made." Making predictions with children who are older, such as when they are in senior high school, may be too late, because the antisocial behavior patterns may have become too firmly established to be modified by simple intervention techniques. The consensus in the literature tends to support prediction efforts with children in early adolescence, around age 10 (fifth grade) to age 13 (eighth grade). Age 12 is considered to be the "threshold" of delinquency, that age at which children first tend to initiate delinquent careers (Briggs & Wirt, 1965). Identifying the delinquent-prone at age 12, or slightly younger, would perhaps result in the greatest success in delinquency prevention.

How to predict. In an earlier section, the kinds of prediction devices and methods were discussed and evaluated. Purely subjective or clinical methods have not shown success due to lack of reliability in the rating system, and in addition are costly because of the necessity of highly trained staff. Psychological tests such as the MMPI and CPI have been shown to be ineffective. Written tests have most often been prepared for use with adults and are probably not applicable for use with adolescents. According to Venezia (1971), written tests "presume an ability to read...attend to and concentrate upon the task, and provide the required behavior in a reliable fashion.... Evidence indicates that the very children who are to be identified may be the ones for whom the least definitive test results are obtained."

In Hathaway and Monachesi's work with the MMPI they found that "the pre-delinquent boy is strongly characterized by a tendency to be careless in responding to such an inventory when it is administered in a routine school situation where other boys and girls are working carefully and consistently or that such boys read so poorly that they answer items in a random fashion or, finally, that they are psychologically ill" (1957).

Kvaraceus and Miller (1959) suggest that a practical and valid prediction method would "employ observation techniques, such as check lists, graphic rating scales and anecdotal records, rather than self-inventory questionnaires or test items, which place too heavy a burden on the young respondent's memory, self-analysis, reading capacity, and seriousness of purpose." Jesness and Wright (1977) state that the most effective means of prediction "results from combining teacher judgments along with other data such as personality measures, and school records indicative of misconduct, underachievement, or truancy." Research currently being conducted in the Grant School Delinquency Prevention Project will provide some evidence on the predictive efficiency of data gathered via the written test.

Another criticism leveled at written tests has to do with how the test scores are used--whether a child will be labeled due to test results and whether his civil rights are violated. However, the same concern should be directed towards clinical judgments. According to Jesness & Wright (1977), "Great care should be taken in using ratings of behavior, personality profiles, grades, or teachers' ratings or any other kind of information, including human judgment, for selecting persons for special assistance," and "The use of tests will not increase or decrease the misuse of information about students."

School Behavior and Teacher Ratings

Possibly the most practical and efficient method of obtaining data to be used for prediction would be to use ratings of students made by teachers. "Obviously, the school is in a strategic position for early detection of the potential and serious offender. The school has on its staff professionally trained observers who know children and youth. Moreover, schools receive the youngster early and maintain a close and prolonged contact with him and his family.... Since schools exist everywhere--in rural areas and small and large cities--they have both a responsibility and an unusual opportunity for prevention through early identification" (Kvaraceus & Miller, 1959).

The importance of school behavior cannot be overlooked. Robins (1966) found that problem behavior in school was highly associated with adult anti-social symptoms, including alcoholism, criminal behavior, and sociopathy. In most studies of delinquency, beginning with the Gluecks in 1950, there have been findings that delinquents experience more problems in school. School misbehavior or failure can be considered a potent predictor of delinquency; it has its place in the causal chain of events leading to delinquency (Polk, 1975; Wright, 1977).

There have been numerous studies in which teachers have been used to predict delinquency or problem behavior. Amble (1967) found that teachers could reliably predict later school drop-outs, based on behavior ratings made on students during the ninth grade. Khlief (1964) notes only moderate success with teacher ratings predicting delinquency. However, he attributes this to the fact that in most studies teachers have been required to respond to sets of predetermined items, causing the teacher to remove him/herself from a working frame of reference. In his study, Khlief used naturalistic assessments of behavioral problems in the classroom based on teacher comments entered in the school cumulative record. These comments were recorded on every student by his teachers at the end of the school year, and were unstructured in any way. It was found that teacher ratings distinguished delinquents from controls along dimensions of misconduct, objectionable personality, poor work habits, poor attitude toward school, and poor attendance. Khlief concludes "that teachers do make sensitive and reliable observations of behavioral problems--observations that may be used in picking out children for remedial action programs."

Hathaway and Monachesi, in their prediction study using the MMPI, also analyzed teacher ratings. At the time of the MMPI testing, teachers were asked to name the children who seemed likely to get into trouble with the law or develop emotional problems. The data led the authors to believe that teachers may have a tendency to underselect delinquents among those students who maintain good grades or come from high socioeconomic classes. Predictions of delinquency seemed to be based on low intelligence, poor grades, low social class, and coming from a broken home. However, the teacher predictions of delinquency were more accurate than those derived from the MMPI.

Scarpitti (1964) studied teachers' predictions with a sample comprised of sixth-graders in slum schools in Columbus, Ohio. The sample was limited to white boys, 125 of whom were nominated as nondelinquents and 101 identified as potential delinquents. All boys found to already have had previous police contacts were eliminated from both groups. Data on the sample were collected through parent interviews, written tests, and background variables. Four years later a followup study showed that 96% of the locatable "good" boys had remained in school, compared to 61% of the predelinquents.* Four percent of the nondelinquent group had police contacts four years later, compared to 39% of the predelinquents. The mean number of offenses for the nondelinquents who got in trouble was 1.0 whereas an average of more than three offenses had been committed by the predelinquents who had arrest records. The difference between the proportions of subjects in the two groups who got in trouble is significant beyond the .001 level.

Venezia (1971) examined Craig and Glick's data, looking at the accuracy of predicting from school misbehavior to future delinquency and found that only 33% of the identified predelinquents became delinquent (a finding similar to Scarpitti's). Venezia felt the low predictive accuracy was due to the vague definition of problem behavior that was being predicted. He states "No basis exists to expect that run-of-the-mill classroom misbehavior is strongly associated with the severe forms of persistent delinquency defined by the authors. A focus upon the more serious behavior problems might be anticipated to produce better results."

In another study (Feldhusen, et al., 1973), all teachers of third, sixth, and ninth grades in an entire Wisconsin county identified 568 students whose behavior was persistently aggressive-disruptive and 982 who displayed pro-social behavior. Of the identified aggressive-disruptive group, 48% had at least one police contact 8 years later, compared with 22% of the pro-social group. Five and eight years later, achievement test scores of the two groups were compared using analysis of covariance to control for initial I.Q. differences, and the aggressive-disruptive youth scored lower on all indices.

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*Of the identified predelinquents who had dropped out of school, nearly half had been in trouble, while only one third of those predelinquents still in school had experienced similar difficulty. This contradicts other findings that have indicated dropouts get in more trouble while still in school than after they leave (see Wright, 1977 for references on this finding).

The accuracy of teacher predictions can be improved by designing objective methods for rating those behaviors that are most predictive of later problems. Stott (1960) recommends that prediction be based on ratings of behavior rather than environmental or sociological factors. Kahn (1965) suggests that if there is need to develop a formal instrument, "why not perfect one of many quite successful devices now available for identification of those children who may need help, rather than concentrating on the technically more complex job of differentiation by type of trouble likely to emerge?" There are advantages of Kahn's suggestion: by dealing with currently existing problems we may avoid the alleged negative effects of labeling and other problems such as invasion of privacy. "Preventive intervention, then, could be predicated upon a child's current needs rather than on a prediction of future behavior. There would be no need to label and treat a child as delinquency-prone or predelinquent" (Venezia, 1971). To adopt such a policy and make it succeed, "The prediction/identification process would need to be an ongoing one. The preventive intervention objective would be to make sure that services (tutoring, family counseling, etc.) were made available to those youth for whom the probability was highest that the manifest problem would not be expected to go away as a natural part of the maturational process" (Jesness & Wright, 1977).

Summary and Conclusions

This paper presented a review of some of the available literature on the early identification of delinquent-prone children. Recognizing that delinquency prevention is both a needed and desirable program, the author has attempted to describe the integral role that can be fulfilled by delinquency prediction methodology. Following is a brief summary of the report findings, along with recommendations to be considered by those responsible for the development of effective delinquency prevention programs.

Definition of Delinquency

The most commonly used measure of delinquency is the official record of juvenile arrests. These officially-recorded data are used by government agencies and by local agencies, including many youth service bureaus and diversion programs. However, research has uncovered vast amounts of "hidden delinquency," delinquent acts undetected and unreported to law enforcement agencies (Wirt & Briggs, 1965; Haney and Gold, 1973). Included among the findings was the alarming fact that there are nine undetected delinquent acts for every delinquent arrest.

The selection of a definition of delinquency depends much on how it will be used. If it is desired to measure the impact of a prevention program on the local delinquency rate, it might be appropriate to either use official arrest data alone, or in combination with self-report data. On the other hand, if the goal is to reduce the frequency of delinquent behavior among a particular population of youths, it may be more appropriate to rely more heavily on self-reports of delinquent behavior since they more accurately guage the true incidence of delinquency. Other factors to be considered are the ease with which either type of data can be collected, the reliability of the data, and which kind of data can most realistically be expected to reflect the impact of prevention efforts.

Data collection. Official statistics must be obtained from the files of law enforcement agencies. Such data are not always easily accessible. In addition, the "right to privacy act" sometimes makes it impossible to use client names in obtaining arrest data. Self-report data can be obtained confidentially, using code numbers to identify clients. However, while it

is relatively simple to obtain self-report data from clients during point of contact with the program, obtaining followup data presents greater difficulty, such as locating subjects at the end of the followup period.

Reliability. The data on unreported delinquency glaringly point out that officially-reported arrest statistics underestimate the actual number of delinquent acts being committed. But official records have the attribute of being a standardized measure of delinquency. Self-report data more reliably reflect the true degree of delinquent behavior, but it is possible that many, if not all, youths might refrain from reporting more serious forms of delinquency.

Impact. If a prevention program is centered in one school or one neighborhood, it is folly to believe that the program will have an impact on the delinquency rate for the entire community (arrest data are often only available by community, township, or city). If the target is a school or neighborhood population, self-report data might be better expected to reflect any impact of the program. In addition, self-report data can be obtained for non-participating groups in order to allow for comparisons of behavior between target and non-target populations.

- It is recommended that self-report measures of delinquency be standardized and used to supplement the official statistics. This would allow a more sensitive analysis to be made of program effectiveness, and would improve the low reliability associated with the sole use of official delinquency statistics, as pointed out by Short and Nye (1970).

History of Prediction

Research in methods for predicting the likelihood that a person will commit a criminal or delinquent act began over 50 years ago. Research reached a peak during the 1950s with the work of the Gluecks, Kvaraceus, Hathaway and Monachesi, and others. Prediction research then went into a hiatus and only recently has interest in prediction been renewed, primarily due to the emphasis on prevention and the disenchantment with the efficacy of rehabilitation.

Attempts to develop valid prediction methods using pre-existing psychological questionnaires such as the MMPI and CPI have shown a notorious lack of success. The long list of predictor variables that have been investigated fall into three categories: (1) sociological and background, (2) psychological or personality, and (3) behavioral. Much research has been done on variables

relating to a client's personal background, socioeconomic status, attitudes, and relationship within the family. Variables related to the family are those most consistently found to be predictive of delinquency.*

• The most efficient prediction method would be one that incorporates reliable indicators from sociological, psychological, and behavioral theory. There is no single cause of delinquent behavior, and investigators must search for a series of variables, interacting on each other, that ultimately cause a child to become delinquent-prone. The work of Wright (1977) should provide valuable insight into this area. In his Grant School Delinquency Prevention Project, he is studying the relationship of a series of variables in the cause of delinquent behavior (family, personality, academic performance, antisocial school behavior, and peer influence).

Arguments Against Prediction

The primary arguments against the use of prediction have been the problem of overprediction and the labeling theory.

Overprediction. Overprediction is the identification of youths as potential delinquents who do not in fact become delinquents. Overprediction occurs because delinquency is a low frequency behavior in the total population, ranging from an estimated 4% among the total national adolescent population (Perlman, 1970), to an actual 35% among youths in Wolfgang's Philadelphia cohort. It is probably impossible to identify 100% of the predelinquents without misclassifying some nondelinquent children. This issue is both a practical and an ethical one.

On the practical side, it is unreasonable to assume that a method can be devised that will identify, before the act, all those who will at one time or another break the law. Nor is there any reason to believe that it would be beneficial to do so (how many of those now working in delinquency prevention would have once been identified as a potential one-time delinquent?). What should be expected from a prediction method is that it identify beforehand those youths who may become serious (habitual, repeat) delinquents). Administrators of prevention programs must decide what would be an acceptable

*Of course, the variable most predictive of delinquency is a previous record of delinquent behavior, but as such cannot serve as a predictor of predelinquent children.

proportion of the potential delinquents to be identified. In making such a decision they must consider the extent of their own resources: how many children can be handled within the existing program? Another consideration would be "How many false positives (incorrectly identified predelinquents) will be acceptable?" This brings us to the ethical issue, and also involves labeling theory.

There is a belief that when a prediction method identifies a child as a predelinquent, in effect, a delinquent label is placed on the child. The environment then supposedly reacts to the child in a different manner, infringing upon his rights and possibly accelerating him into acts of delinquency--the self-fulfilling prophecy phenomenon. The advocates of this theory have not provided conclusive evidence that labeling has any significant negative effect on the persons labeled. On the other hand, in order to be identified as a predelinquent, a child would most likely have certain characteristics (problems) that might in any event hinder his/her chances of developing to full potential. Such persons, it might be argued, would most likely benefit from some form of supportive services.

Prediction Methodology

Several statistical techniques of developing prediction scales are available, including correlational techniques and multiple regression analysis. Most studies indicate an increased reliability of empirical/objective methods over clinical predictions. According to the present state of knowledge, it appears that the most efficient method of developing prediction scales is to utilize theoretical concepts identified as to causal position by path analysis (Duncan, 1966; Wright, 1977), and weighted statistically through multiple regression.

Considerations. Some issues to be considered by those involved in the development of prediction methods are listed below.

1. Establishing a definition of delinquency that is precise, unambiguous, objective, and measurable.

2. Selecting an appropriate target population: youths in a town or city, a school district, a school, clients of a neighborhood YSB or YMCA. Population should be young enough to allow interruption of delinquent tendencies; e.g., ages 10-13.

3. Establishing the goal of the prevention program. The goal will help determine the population. If the goal is to identify and serve the maximum number of potential delinquents, the population can be large (e.g., an entire school district). If the goal is to identify and treat the potential persistent delinquents in order to reduce the number of delinquent acts occurring within a given area, the population can be limited to a smaller group of high risk subjects (selected from YSB referrals, school behavior problems, etc.).

4. Developing a prediction method that minimizes the numbers of false positives.

5. Investigating the possibility of predicting various kinds of delinquency: violent behavior, destructive behavior, avoidance behavior (drugs, truancy, runaway).

6. Designing prospective studies (longitudinal followups) in order to most effectively test validity of prediction methods.

7. Studying the possible effects of labeling.

8. And, if prediction is implemented in a school program, looking for differences in classroom problem behaviors. The Glick study showed a qualitative difference, with future delinquents being aggressive, obstreperous, and academically retarded. Those nondelinquents who misbehaved in school could be more properly classified as socially immature (horseplay, excessive talking, etc.).

Prevention, intervention, and treatment. A youth's "score" on a delinquency prediction scale can identify areas in which treatment can have the greatest effect in preventing (further) delinquency. A prediction scale is comprised of those variables most likely to cause or result in delinquent behavior. Once a prediction scale is completed on a youth, the worker would have a ready-made and convenient list of those areas where intervention or remedial service should be provided. The Gluecks have asserted that an instrument for identifying predelinquents can be of only limited value if it does not furnish clues to treatment needs.

Implementation. The best approach would be that advocated by Jesness and Wright (1977) and Wright (1977). Using prediction methods, we should identify school children who appear to be potential delinquents. The children would not be labeled as anything at this time, nor would they be treated differently other than assuring the availability of those services

(tutoring, family counseling, etc.) thay may ameliorate existing problems before they lead to delinquency. These subjects would be continuously and confidentially assessed and those failing to show improvement on the predictor variables could then be selected for more intensive prevention services.

There have been various studies that have attempted to identify potential school drop-outs, or those children likely to have "problem behaviors" and "emotional problems." The problem remains of determining how much delinquency can be prevented by identifying those children who exhibit classroom misbehavior and offering to them some form of remedial service. As weinberg (1954) has said, "clinicians have difficulty in differentiating between the antisocial person and the criminal. The characteristics of outgoing hostility, defiance, destructiveness, and impulsive aggression, are not the same as criminal behavior. An antisocial person may engage in random acting-out behavior, and still not violate the law--or he may engage in stealing." Hathaway and Monachesi (1957) say that "not all personal maladjustment patterns in boys are indicators of delinquency-proneness." And Kvaraceus and Miller (1959) caution "No one can say...that every or any child who shows a 'saturation' of internal and/or external factors will surely become a violator of legal norms."

Teachers as Predictors

The use of teachers as predictors of delinquency has been supported by several researchers (Jesness & Wright, 1977; Kvaraceus & Miller, 1959; Amble, 1967; Scarpitti, 1964). Others have been less impressed with teachers' ability to identify delinquents (Khlief, 1964; Hathaway and Monachesi, 1953). The inconsistency of teachers as accurate predictors can be attributed to several factors:

1. The vagueness of the criterion teachers have been asked to predict, such as behavior problems, emotional problems, etc.

2. Biases among teachers against predicting delinquency for academic achievers, youths from "good" homes, etc.

3. The fact that teachers base predictions on subjective judgments rather than using objective methods.

At the present, the school appears to be the best arena in which to attack the problem of delinquency. As Kvaraceus and Miller (1959) said, "obviously, the school is in a strategic position for early detection of the potential

and serious offender." The importance of school behavior in predicting delinquency has been indicated (Glueck & Glueck, 1950; Robins, 1966; Polk, 1975; Wright, 1977).

- Further studies are needed to develop efficient, accurate, objective methods to assist teachers in predicting later problem behavior.

Further recommendations. In Jesness & Wright's paper on delinquency prediction (1977), several recommendations were made. Some of them deserve repeating here.

- The Youth Authority should lend active support to the development of intervention programs in the public schools. It is in the school setting that we are most likely to first detect those characteristics of children indicative of future delinquency. Intervention programs in schools would be efficient because access is available to nearly all youth; would serve as an aid in improving the overall school program and the quality of education; and would have long-term cost-effectiveness since more delinquent behavior could be curtailed by reaching troubled children before the problem behaviors become well-ingrained and resistant to change.
- Different forms of intervention services should be explored, including behavior modification in the classroom which was shown to be successful during the Youth Center Research Project (Jesness, DeRisi, McCormick, & Wedge, 1972); the conflict-resolution-through-negotiation model (Wright, 1977); I-level matching of client and counselor; and the use of school curriculum as a vehicle for increasing social maturity among youthful students.

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